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and deriving the frequency dependency of the optical property of the device under test from the synchronized time dependencies.

In The Claims

Please amend the claims as follows:

1. (Amended) A method of determination of an optical property of an optical device under test comprising:

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splitting an incoming light beam into a first initial light beam and a second initial light beam;

splitting said first initial light beam into a first light beam and a second light beam;

coupling the first light beam into the optical device under test;

letting the second light beam travel a different path from the first light beam;

superimposing the first and the second light beam to produce interference between the first light beam and the second light beam in a resulting first superimposed light beam;

detecting the power of the first superimposed light beam for deriving a first signal over time containing information about the optical property of the device under test when tuning a frequency of the incoming light beam over a given frequency range;

splitting the second initial light beam into a fifth light beam and a sixth light beam;

superimposing the fifth and the sixth light beam after the fifth and sixth light beams have traveled a different path, to produce interference between the fifth and the sixth light beam in a resulting second superimposed light beam;

detecting the power of the resulting second superimposed light beam for deriving a second signal over time containing information about a time dependence of a frequency when tuning a frequency of the incoming light over a given frequency range;

compensating a time-delay between the first and the second signal; and

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deriving a frequency dependency of the first signal for deriving the optical property of the optical device under test.

2. (Amended) The method of claim 1, further comprising:

deriving elements of a Jones matrix for the optical device under test from the compensated frequency dependence of the detected powers.

3. (Amended) The method of claim 1, further comprising at least one of:

using a first light beam with defined polarization, detecting the power of the resulting first superimposed light beam as a function of frequency and polarization, and deriving a polarization mode dispersion of the device under test from the information obtained through the measurement, preferably represented as Jones matrix elements of the device under test;

deriving a chromatic dispersion of the device under test from the Jones matrix elements of the device under test;

using said first light beam with defined polarization, detecting the power of the resulting first superimposed light beam as a function of frequency and polarization, and deriving the principal states of polarization of the device under test from the Jones matrix elements of the device under test;

using said first light beam with defined polarization, detecting the power of the resulting first superimposed light beam as a function of frequency and polarization, and deriving the polarization dependent loss of the device under test from the Jones matrix elements of the device under test;

using said first light beam with defined polarization, detecting the power of the resulting first superimposed light beam as a function of frequency and polarization, and deriving the polarization dependent loss of the device under test from the Jones matrix elements of the device under test;

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using said first light beam with defined polarization, detecting the power of the resulting first superimposed light beam as a function of frequency and polarization, and deriving the fast and slow group delays, associated with the fast and slow principal states of polarization of the device under test from the Jones matrix elements of the device under test;

deriving the insertion loss of the device under test from the Jones matrix elements of the device under test;

deriving a transmissivity of reflectivity of the device under test from the Jones matrix elements of the device under test; and

using a first light beam with defined polarization, detecting the power of the resulting first superimposed light beam as a function of optical frequency and polarization, and deriving higher-order polarization mode dispersion parameters from the Jones matrix elements of the device under test.

4. (Amended) The method of claim 1, further comprising:

choosing the time-delay to be $\frac{1}{2}.(\tau_2-\tau_1)+\tau_d$

τ_2 being the delay of the sixth light beam relative to the fifth light beam, τ_1 being the delay of the first light beam relative to the second light beam, $(\tau_2-\tau_1)$ being an internal delay, and τ_d being an external delay.

5. (Amended) A software program or product for executing a method when run on a data processing system, said method comprising:

splitting an incoming light beam into a first initial light beam and a second initial light beam;

splitting said first initial light beam into a first light beam and a second light beam;

coupling the first light beam into the optical device under test;

letting the second light beam travel a different path from the first light beam;

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superimposing the first and the second light beam to produce interference between the first light beam and the second light beam in a resulting first superimposed light beam;

detecting the power of the first superimposed light beam for deriving a first signal over time containing information about the optical property of the device under test when tuning a frequency of the incoming light beam over a given frequency range;

splitting the second initial light beam into a fifth light beam and a sixth light beam;

superimposing the fifth and the sixth light beam after the fifth and sixth light beams have traveled a different path, to produce interference between the fifth and the sixth light beam in a resulting second superimposed light beam;

detecting the power of the resulting second superimposed light beam for deriving a second signal over time containing information about a time dependence of a frequency when tuning a frequency of the incoming light over a given frequency range;

compensating a time-delay between the first and the second signal; and

deriving a frequency dependency of the first signal for deriving the optical property of the optical device under test.

6. (Amended) An apparatus for determination of a property of an optical device under test comprising:

a first beam splitter in the path of the incoming light beam for splitting the incoming light beam into a first initial light beam traveling a first initial path and a second initial light beam traveling a second initial path;

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a second beam splitter in the path of the first initial light beam for splitting the first initial light beam into a first light beam traveling a first path and a second light beam traveling a second path, wherein the optical device under test can be coupled in said first path for coupling in the first light beam;

a third beam splitter in said first and in said second path for superimposing the first and the second light beam after the second light beam has traveled a different path as the first light beam to produce interference between the first light beam and the second light beam in a resulting first superimposed light beam traveling a first resulting path;

a first power detector in said first resulting path for detecting the power of the resulting first superimposed light beam traveling the first resulting path as a function of frequency when tuning the frequency of the incoming light beam over a given frequency range;

a fourth beam splitter in said second initial path for splitting the second initial light beam in a fifth light beam traveling a fifth path and a sixth light beam traveling a sixth path;

a fifth beam splitter in said fifth and said sixth path for superimposing the fifth and the sixth light beam after said fifth and sixth light beam have traveled a different path, to produce interference between the fifth and the sixth light beam in a resulting second superimposed light beam traveling a second resulting path;

a second power detector in said second resulting path for detecting the power of the resulting second superimposed light beam as a function of frequency when tuning the frequency of the incoming light beam over a given frequency range;

whereby an output of the power detector is connected with an evaluation unit for:

detecting a time dependence in a tuning gradient of the frequency when tuning the frequency of the incoming light beam over the given frequency range,

using a time-delay for compensating an external and/or an internal time-delay, and

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deriving the optical property of the optical device under test from the compensated optical frequency dependencies of the detected powers.

7. (Amended) A method of determination of an optical property of an optical device under test comprising:

tuning an optical frequency λ of an optical beam;

deriving a dependency of the optical frequency λ of the optical beam over a first time period t;

deriving a dependency of the optical property of the device under test over a second time period $t+\Delta t$;

synchronizing the time dependency of the optical frequency λ of the optical beam with a time dependency of the optical property of the device under test; and

deriving the frequency dependency of the optical property of the device under test from the synchronized time dependencies.

8. (Amended) The method of claim 7, wherein deriving a dependency of the optical frequency λ and deriving a dependency of the optical property of the device under test are performed with the use of at least one interferometer.

9. (Amended) The method of claim 7, wherein synchronizing the time dependency of the optical frequency λ of the optical beam with a time dependency of the optical property of the device under test is performed by

using a time-delay to synchronize the time dependency of the optical frequency λ of the optical beam with the time dependency of the optical property of the device under test.

10. (Amended) The method of claim 7, wherein the synchronization is dynamic or static.

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11. (Amended) A method of determination of an optical property of an optical device under test comprising:

tuning a frequency of an incoming light beam over a given frequency range;

splitting the incoming light beam into a first initial light beam and a second initial light beam;

splitting said first initial light beam into a first light beam and a second light beam;

coupling the first light beam into the optical device under test;

letting the second light beam travel a different path from the first light beam;

superimposing the first and the second light beam to produce interference between the first light beam and the second light beam in a resulting first superimposed light beam;

detecting the power of the first superimposed light beam for deriving a first signal over time containing information about the optical property of the device under test;

splitting the second initial light beam in a fifth light beam and a sixth light beam;

superimposing the fifth and the sixth light beam after said fifth and sixth light beams have traveled a different path, to produce interference between the fifth and the sixth light beam in a resulting second superimposed light beam;

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detecting the power of the resulting second superimposed light beam for deriving a second signal over time containing information about the time dependence of the frequency;

compensating a time-delay between the first and the second signal; and

deriving a frequency dependency of the first signal for deriving the optical property of the optical device under test.

Please add the following new claims:

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12. (Newly added) The method of claim 3, wherein the higher-order polarization mode dispersion parameters include the rate of change of the differential group delay with frequency.

13. (Newly added) The method of claim 5, wherein the software program or product is stored on a data carrier.

14. (Newly added) The apparatus of claim 6, wherein the optical device under test is a heterodyne optical network analyzer.